PRESENT CONDITION OF THE BASSAE TEMPLE.

FURTHER EVIDENCE FOR DYNAMIC SYMMETRY IN ANCIENT ARCHITECTURE.

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IT will be understood that within the limits of an evening's talk it will be impossible to explain in detail the complete plan of a building such as that of the Parthenon, where refinement of composition is carried to an extreme. I have, therefore, limited myself to the most essential part of the structure, the temple proper or the room which contained the statue of the goddess. Within this room I shall confine my remarks to that part which immediately enclosed the statue. This is the area defined by the column centres surrounding the nave and also the nave itself. Other proportions of the building may be briefly mentioned.

It would seem, judging from the plan as it is now possible to present it, that this part of the cella area was considered by the architect, or the architect in collaboration with the sculptor, as of the utmost importance. It is significant that the statue-enclosing part of the general plan of the building should be found to be based upon that area which constitutes the crux of the dynamic symmetry idea. This area is represented by the difference between root 4 and root 5. The root 4 area is composed of two squares and the root 5 shape is fixed by a diagonal to these two squares. Numerically root 4 equals 2 and root 5 equals 2·236. The area in question, therefore, is represented by unity, or a side of one of the two squares, and ·236—more exactly ·236068 plus. This number, being less than unity, is the reciprocal of some number representing some area greater than unity. Division into unity shows us that the number or area in question is 4·236, that is, it is composed of root 5, or 2·236 plus root 4 or 2—two squares plus a root 5 rectangle. It will be noticed that this mysterious figure, which is really the key to classic Greek proportion, is a compound of the two generating shapes, root 4 and root 5. It is beside the point to say, as so many of the intellectual lazy do say, that a few simple numbers in connection with the few simple operations of arithmetic are abstruse and difficult to understand. Experi-

ments with lower grade school children have shown that there is nothing more abstruse in the presentation of symmetry in terms of arithmetic than the average boy or girl of twelve or fourteen may understand. I have elected to use terms of arithmetic for the reason that they supply a method of proof which would be difficult and abstruse if any other scheme were employed for this purpose.

The point needs stressing that we are now inspecting symmetry by analysis. The Greeks probably never had occasion to approach the subject from this angle. All the proportions which we find in classic temples develop logically from simple areas, and no instrument more complicated than a string or rope would be necessary for the synthetic operation. The plan of the temple as it stands to-day is something in the nature of a geometric puzzle, and to find a clue to its solution we must employ every means of analytic approach which ingenuity can devise.

To return to the areas themselves. Practice in the subtleties of manipulation of these shapes teaches us that we may regard any figure of the dynamic series as divided or multiplied by ten—*i.e.*, we have in these areas a natural decimal system. If we multiply ·236068 by 10, we obtain 2·36068 and its reciprocal will be ·4236 or 2·36068 divided into 1, and if we divide a 2·36068 area by 10, each one of the ten divisions will be a 4·236 area and each may be represented by its reciprocal ·236068.

The decimal manipulation of this specific area is what we actually find in the plan arrangement of the Parthenon cella. The nave is surrounded by twenty-three columns, ten on each flank and three on the west end, not counting the angle columns in the latter case. The east end is fixed by the wall and doorway. This arrangement means that the area defined by the centres of these columns is divided into ten strips, each strip being fixed by an intercolumniation and one strip by column centres and the east wall. We obtain these strips by drawing a line from centre to centre of opposing columns across the nave. Eight of these strips of area are equal in width ; two are not. The area defined by the east wall of the statue room and the centres of the first opposing columns to the west of the wall, and the area defined by the angle column centres and the centres of the first opposing columns to the east are unequal in width and both are unequal with the eight regular intercolumniations. The two unequal strips we may designate as east and west strips. The west is wider than the east strip, but the two added together equal exactly two of the regular intercolumniation strips. In contrast to the angle and second column centres of the peristyle the angle and second column centre widths of the cella are greater than the regular intercolumniations, considerably so.

If we take the length as defined by the east wall of the cella and the centres of the angle columns—*i.e.*, 85·5012 feet—and divide it by the width, 36·22 ± feet, from centre to centre of opposing columns across the nave, we obtain the ratio 2·36068.

Fig. 1.

Penrose says the mean for the eight regular intercolumniations is 8·55 feet. It is clear from the above ratio that each of these eight regular strips will have the reciprocal ratio ·236068, this reciprocal being that of 4·236—*i.e.*, each of these areas will be composed of two squares plus a root 5 area ; 2 plus 2·236 (see Fig. 1).

For the purpose of making the general plan clearer the two squares are placed in the centre of the above arrangement.

The distance from the east wall to the centre of the first column to the east is 7·5337 feet, plus or minus. If this is divided into 36·22, plus or minus, we obtain the reciprocal ratio ·208.

The distance from the centre of an angle column to the centre of a first column to the east is 9·562 feet, plus or minus. Dividing this into 36·22 we obtain the reciprocal ratio ·264. This, added to ·208, equals ·472 or ·236 multiplied by 2—*i.e.*, these two strips of unequal width, added, equal two of the eight regular strips.

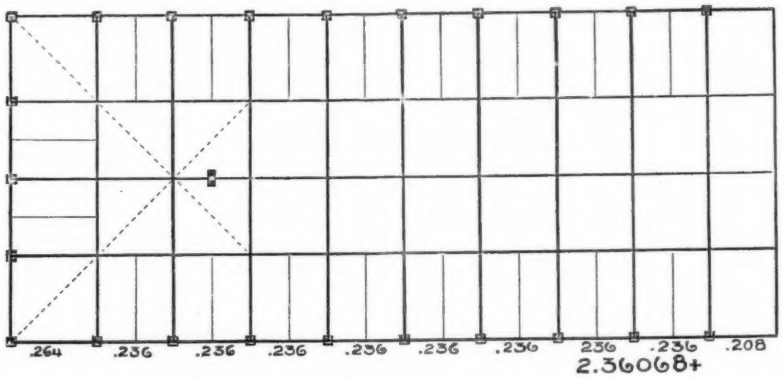
The entire length of the area we are inspecting is 85·5012 feet, plus or minus. Eight regular intercolumniations of 8·55 feet equal 68·40 feet. Adding 9·562 and 7·533 we obtain 17·095. This, added to 68·40, equals 85·495. Subtracting this from 85·5012 we have an error of ·006 or about

six one-hundredths of an inch in over 85 feet. Combining Penrose's, Döerpfeld's and my own measurements for this particular section, this error is much reduced if not entirely eliminated. It may stand, however, as it is within the error of workmanship of even classic masons.

Dividing ·208 and ·264 into unity we find that the former is the reciprocal of 4·7888 and the latter of 3·7888.

The reciprocal of root five is ·4472, also a root five area. If this is multiplied by 4 the result is 1·7888. From this we see that the ·208 figure is composed of three squares plus four root five areas. 3 plus 1·7888 equals 4·7888, while ·264 represents an area composed of two squares plus four root five areas; 2 plus 1·7888 equals 3·7888.

In the distribution of the area elements of the eight regular strips we have two squares in the centre and two small root five shapes on either end as in Fig. 1. The purpose of this arrangement becomes apparent when we consider the ·264 strip at the west end of the great rectangle. Here, instead of the above arrangement, we have two large squares defined by the centres of the angle columns and the centres of the columns immediately to the north, south and east, and instead of two squares in the centre there are four root five rectangles, Fig. 2.



The rectangular black spot is the centre of the statue base.

Fig. 2.—The 2·36 Rectangle from the Parthenon Cella.

The presence of these two areas, ·208 and ·264, on the east and west ends of the great rectangle of the cella column centres leaves no doubt in my mind that this distribution of form elements was intentional on the part of the architect.

There is an element in this plan scheme which makes it exceedingly easy of verification. The large strip at the west end of the great rectangle, represented by ·264, more accurately ·263962, added to the strip immediately adjoining it to the east, exactly equal two squares. ·264 plus ·236 equals ·5 or the reciprocal of two squares, one lying on the other. These two squares represent the area defined by the centres of the angle columns and the centres of the second columns to the east. But the west side of the porous stone base of the statue of Athena is fixed by a line drawn from centre to centre across the nave of these two second columns. This west side of the porous stone base is slightly uneven, due to the apparent fact that the masons preferred to cut them to fit rather than the pentellic marble blocks. Even a casual inspection, however, makes it clear that the west side of the porous base is on a line with the two column centres mentioned.

It is also clear by inspection that the width of this porous stone statue base is equal to one of the regular ·236 intercolumninations. Precisely in the centre of this statue base is a rectangular hole which is generally admitted to be the centre of the Athena statue. If we draw a north and south line through

the centre of this hole we divide the ·236 area into two equal parts. Divided by 2 the result is ·118. If, to the rectangle to the west of the statue base composed of two squares and represented by the reciprocal ratio ·5* we add ·118 the result is ·618 or a rectangle of the whirling squares—that is to say, the statue of Athena stood exactly on a side of a rectangle of the whirling squares, and this shape is defined by the centres of the columns surrounding the sacred spot.

One side of this rectangle furnishes a line cut in the traditional Greek proportion of extreme and mean ratio. Throughout the ages the story has been persistent that this ratio was used in temple building. Many attempts have been made to discover how the proportion was used, but they have all failed. It is now clear that it is a derivative of another and more important proportion—*i.e.*, root five —and, by itself, means little if anything.

Pushing our inspection of the cella proportions further, we may exclude or include the base blocks on which the columns stand. In either case we find the enclosed areas proportional arrangements of the basic form of square and root five and a definite symmetrical part of the cella or of the entire building. The entire cella proportion, from wall to wall east and west and north and south, is defined by the ratio 1·559. We may regard the fraction ·559 either as one-fourth of root five or as a reciprocal of 1·7888. In the latter we have four times the reciprocal of root five. It should be remembered that a reciprocal shape is a similar figure, and that root rectangles are composed of even multiples of reciprocals —that is, even multiples of root figures or similar shapes to the whole. A root five figure is composed of five reciprocals, each one being a root five shape and having the fractional ratio ·4472 or one-fifth of 2·236. Four times ·4472 equals 1·7888. We see, therefore, that the entire cella plan is an arrangement of a square plus four root five rectangles. The length of the cella is 98·145 feet and the width 62·95 feet. These measurements give us the ratio 1·559. The wall to wall width of the cella is fixed by a sill or plinth block at the south-east corner of the room where a portion of its surface was cut away to receive one of the first stones of the wall. This sinking is not found on any other stone. It may also be mentioned here that the explosion of Turkish powder which destroyed the interior of the Parthenon seems to have spread the east end of the interior of the naos. Many measurements across the interior show that the east end is about one centimetre wider than the west end.

If we extend the column centre rectangle previously described to include the base blocks upon which the columns stand we have another scheme in square and root five. The ratio is 2·174 which, is composed of ·559 multiplied by 2 plus ·528 multiplied by 2. The ·559 fraction will be remembered. The ·528 fraction is a reciprocal of a square and two root five shapes—that is, ·4472 multiplied by 2, or ·8944 plus 1.

If we exclude the column bases and retain the nave only, which is beautifully defined as a sunken rectangle about three centimetres lower than the rest of the floor of the cella, we get the ratio 2·59017, the fraction being one-fourth of 2·36068. The nave ratio may be regarded as root five divided by 2— that is, 1·118 plus 1·472. This would be two root five figures plus a square and two ·236 shapes. In both the above cases of exclusion or inclusion of the column base blocks the area in the rear of the porous stone base of the statue will be two squares, so we may, in either, check the scheme by this simple area. Consideration of the nave proportion emphasises a point of extreme interest which seems to be true of most if not all Greek buildings of the best period. This point is that the paving stones of the temples in their final position were cut more or less accurately to fit a definite proportion. The Parthenon nave is a good example. It is apparent by inspection that this sunken rectangle is divided, east and west, into six equal parts, and that the north and south divisions are two to every intercolumination. Knowing the overall proportion of the nave, it is a simple matter to determine the proportions of each of the paving blocks. When this is done we again find a rhythm repeat of the entire scheme of the building. Also the paving block proportions over the entire ground plan may be examined in the same way.

* See last year's Paper: "Greek Design," by Jay Hambidge (JOURNAL R.I.B.A., pp. 213 *sqq.*)

When we find one block larger or smaller than it should be we find that some kind of a compensatory allowance exists at some other spot.

The overall proportions of the ground plan of the Parthenon may include the euthynteria, the bottom step, the middle step or the top step, in every case we find a definite arrangement of the basic theme analogous to that of the cella. The top step proportions exhibit the danger of hasty and ill-considered generalisations which have been prevalent in the past. Most writers about classic architecture seem to be fond of referring to the stylobate proportion of the Parthenon as 1 to 2·25—that is, one to two and a quarter. This is entirely misleading, as Döerpfeld found in his search for even multiple measurements and it results in an error which no one familiar with the building would tolerate. The ratio is 2·2514 plus. We are confident that this is the ratio, because we may place all the column centres of the peristyle by it and determine precisely its relation to the general and detailed proportions of the building.

From the data now at hand I am convinced that the proportion of the bottom step was the one actually used as a correlator. This ratio is 2·146. It is composed of ·618 plus ·382 multiplied by 4—that is, ·618 plus 1·528. I wish to emphasise this latter proportion because of its definite appearance in the temple at Aegina and elsewhere. The fraction ·382 is the difference between ·618 and unity. It is also the reciprocal of 2·618 or 1·618 squared. The stylobate ratio of the Apollo temple at Bassae is 2·618. The stylobate ratio at Sunion is 2·309. The fraction ·309 equals ·618 divided by 2.

The proportions of the façade elevations of the Parthenon may be fixed either by the bottom step or by the euthynteria. The bottom step supplies the ratio 1·7236. The euthynteria, including width and height, has 1·7082. The fraction ·7082 is equal to ·236 multiplied by 3. The flank elevation is equal to 1·7082 multiplied by 2 plus ·236. We may divide front or flank elevations by any logical member such as cornice architrave or stylobate, and in every instance obtain a definite and rational part of the major scheme. Likewise we may consider any detail by itself such as column or column head, the profile of the echinus, the abacus by itself, the metope or the metope and triglyph combined—in this case the mean metope width ; the mutule with its guttae, the profiles of mouldings, the pattern forms on these mouldings, the coffers, singly or in groups, or the antafixae.

It is worthy of remark that the guttae of the mutules are arranged on a 1·559 scheme, that is this adjustment repeats the plan of the cella. Our limit of time this evening will not permit us to consider the construction of the antafix of the Parthenon. The same block of marble which contained the lion-head spouts at the four corners of the building also included an antafix carved in the same block. Fortunately, I was able to obtain rubbings of these as well as careful measurements. Modern designers have assumed that Greek meanders were laid out by a square with its area divided into even multiples. If the Parthenon is a standard, this practice is entirely wide of the mark. And, probably, just this point emphasises the difference between modern design thought and the practice of classic craftsmen. Before we can plan the double meander over the panathenaic frieze or the single meander under the cornice we must divide our areas into dynamic sections. And this means that the horizontal divisions are not the same width as the perpendicular divisions. The difference is slight and subtle, but it is just the difference between the best classic design and modern designers of England to-day.

The architect of the Parthenon, Iktinos, is known to have built another building in Greece, either before or after the construction of the great Athena building on the acropolis. This was the temple of Apollo Epikurios at Bassae in Phigaleia. The site is on the bleak and almost inaccessible Mount Kotylion in Arcadia. Fortunately the building is in a sufficiently good state of preservation to enable us to determine the symmetry of the ground plan and of the elevation as far as the architrave. A peculiarly happy chain of circumstances has thus resulted in the saving of two examples of the work of the man who is probably the greatest architectural designer in history and, as luck has it, these buildings are ideal examples for proportion comparison. Every student is familiar with the sophisticated curve system of the Parthenon. Indeed, so much has been written about these curves that the average

person has come to believe that the superiority of the building is largely due to them. But there are no curves in the building at Bassae in the sense that there are in the Parthenon. The horizontal lines are straight and there is no entasis to the column. Yet the structure had a great reputation in ancient times. Pausanias tells us that, next to the temple at Tegea, it was the best in the Peloponnesus. The Tegea building is later and supposed to be by Scopas. Knowing his style we can imagine something of the quality of an architectural design by him. If the judgment of Pausanias is sound, and there is much reason for accepting it, then, before the rebuilding of the older Tegea temple, the Bassae structure must have been the most considerable in the Peloponnesus—better, indeed, than anything at Olympia —and this would include the great Zeus temple there. But we may ignore the opinion of Pausanias and depend upon our own judgment. The structure as it stands is evidence that it must have possessed superlative beauty before the erosion of time, the hand of man and earthquakes disfigured it. Penrose visited Bassae, but he seems to have lost interest in the temple when he could find no curves. He appears to have been slightly peevish about things at Phigaleia. He speaks of the bleak situation and the fact that there was no indication of verdure on the mountain top as late as 26th April. He had had an encounter with brigands and had been relieved of most of his pet measuring instruments. He must have been annoyed. At any rate, whatever the influence that induced the neglect, he left no data for the temple. Cockerell also visited Bassae, and as a result produced the very clever book we know. He was too brilliant for accuracy, however, as the scant measurements he furnishes on his drawings show. We might stretch the point a bit and accept his figures for the length of the stylobate, but the width he supplies is impossible. Blouet, the architect of the French Scientific Expedition to the Morea in 1833, seems to have been more accurate, but he was just as stingy with his data as Cockerell. The result of all this is that we possess no complete and reliable record of this extremely interesting temple above the clouds at the glen or ravine (the meaning of Bassae) in Phigaleia.

Because of this I visited the temple site in January of this year, lived some two weeks in an open hut on that wild, bitterly cold, but fascinating situation, and made measurements for my purpose. Before leaving Athens I had glanced at Blouet's work, but made no notes because the data were so slight. On my return I found that what few measurements he gives agree very well with the ones I had obtained. Our figures for the angle column centres of the peristyle are the same, as are those for the step projection. He neglected the euthynteria. His Naos length is practically the same as mine as are also his other figures as far as they go, with a few exceptions.

The length of the ground plan, including the euthynteria, is 39·80 ±.

The width of the ground plan, including the euthynteria, is 16·10 ±.

The ratio, obtained by dividing the width into the length, 2·472.

This is equal to 2·236 plus ·236. Or it might be considered as ·618 multiplied by 4.

(The measurements of the Parthenon are given in feet and hundredths to facilitate comparison with Penrose's figures. For all other buildings I use the metre.)

The step projection, obtained at the north front where there is least disturbance from earthquake, is :

Tread of the middle step	·32
Tread of the bottom step	·31
Euthynteria	·108
Total	·738

This, multiplied by 2, gives us the amount necessary to subtract from the total length and breadth to fix the proportion of the stylobate. We may reverse this process and from the measured length and breadth of the stylobate add the step projection to fix the total length and breadth.

39·80 minus 1·476 equals 38·324 ± length of the stylobate.

16·10 minus 1·476 equals 14·626 ± width of the stylobate.

The stylobate ratio is 2·618, the reciprocal of which is ·382.

38·324 divided by 2·618 equals 14·638, error ·012.

The actual measured width of the stylobate varies between 14·60, 14·61 and 14·64, depending on whether the measurements are taken on the original stones or whether they include new blocks put in by the Greek Archæological Society. We obtain the short measurements from the latter.

The length of the Naos is 28·07 ±.

The width of the Naos is 8·66 ± ; the ratio 3·236.

28·07 divided by 3·236 equals 8·674, error ·014.

We find slight irregularity in all measurements of the temple, except very short ones, due to erosion and earthquake disturbance. The photographs show the shattered condition of many of the stones, particularly those of the steps of the west flank. The inequalities are more apparent than real, however, as the measurements show we can be fairly certain of accuracy within, say, 2 centimetres for long lines. This is sufficient to fix, unmistakably, the character of the plan, particularly when the sequence is maintained without variation as we here find it.

The length of the cella is 16·864, the width 6·822, and the ratio is 2·472, or a similar figure to the overall plan. It will be remembered that the dominating factor in the cella arrangement of the Parthenon is ·236, or the difference between root 4 and root 5. If we divide the overall length of the Bassae plan by 2·36 we obtain the length of the cella. Likewise, if we divide the width by the 2·36 width of the cella is the result.

Before obtaining the Bassae data I was uncertain whether we had recovered the actual process that the Greek designers used in fixing their proportions. There was no doubt whatever in my mind about the proportions themselves ; I was uncertain merely about the method of manipulation. Now I am convinced we have almost the exact process.

It may be said in passing that W. B. Dinsmoor, the American architect, has succeeded in obtaining accurate measurements of the earlier Parthenon—*i.e.*, the building which was in course of erection and was destroyed by the Persians when they took Athens. These measurements are :—

Length, 76·816.

Width, 31·39.

Resulting ratio, 2·4472,

or two squares plus a root 5 figure. It is interesting to find that this proportion is that of the great rectangle determined by the column centres of the Zeus temple at Olympia. 76·816 divided by 2·4472 equals 31·3893, error ·0007.

The temple at Ægina is older than the Parthenon, older than the Zeus building at Olympia, therefore the finding of a persistent dynamic proportion theme in the structure which is simply a variation of the themes at Bassae, Olympia and Athens suggests that symmetry schemes had some sort of ritual significance. And this is borne out by the record from India. About the time of the erection of the Greek temples of the best period, if not somewhat earlier, there existed in India specific rules for sacrificial altar construction. These have survived as the Sulvasutra or " rules of the cord," better " rules of rope." Some authorities date the Sulvasutra about 800 B.C. Others place it at 600, 500, 400 and even 200 B.C. The exact date is immaterial, as the point of importance for us is that these rules describe in detail the construction of the root rectangles which constitute the base of classic Greek proportion. Modern mathematicians—Heath in England, for example*—have wondered why the rope rules did not include rectangles higher than root 5. The explanation is that root 5 contains the secret of proportion ; higher rectangles are unnecessary.

In addition to the description of root rectangles the Sulvasutra also gives instructions for fixing right angle triangles by numbers. The 3, 4, 5 triangle of course is well known. Historians tell us that

* See Heath's notes for the 47th proposition of the first book in his edition of the *Thirteen Books of Euclid*.

this triangle was used for fixing a right angle at a very early date in Egypt (see Gow's *History of Mathematics* ; also Cantor's explanation of Egyptian Rope Stretchers). It is not generally known, however, that Pythagoras supplied a rule for the determination of right angle triangles by numbers, beginning with odd numbers, and that Plato, later, extended the rule to include "beginning with even numbers." The Pythagorean rule is to select an odd number, for example 3. Then to square it. From its square, 9, subtract unity and obtain 8. Divide this by 2 and obtain 4, the second term. To this add unity to find the third term 5. The Sulvasutra contains descriptions of the most important triangles derivable from this rule. This digression about rope rules and rope stretchers is for the purpose of emphasising the point that the stretcher was the ancient surveyor. His was the necessary preliminary work before any building of importance could be started. The first step toward the survey was the fixing of an orientating line to determine the axis of the building. This done, the need was imperative for the establishment of a line at right angles to it, and the process employed for this purpose was that for determining a right angle triangle by whole numbers ; generally 3, 4, 5. A rope was divided into 12 parts. Three of these parts, or four, would be made to coincide with the orientating line. This was fixed by pegs. Four parts of the marked rope, or three, would be arranged so the remaining five parts would constitute the hypotenuse of the triangle. If this were carefully done the angle formed by the juncture or meeting of the three and four parts would be a true right angle. (See Sir Norman Lockyer's *Dawn of Astronomy* for descriptions of the Egyptian practice of fixing the four corners of the temple.) A survey prepared in this manner constituted the base for fixing the dynamic proportions which we find in Greek temples. All of these proportions follow naturally and simply from the right angle. A plan of the Bassae temple is a good illustration (Fig. 3). As mentioned above, the ratio of this proportion is 2·472. In Fig. 3 assume that A B is an orientating line of any length (in this case drawn from north to south, nearly). Let C F or C D be constructed at right angles to A B and be made the width of the temple. Construct the two squares C D and make A E equal to C D. The area A D will be that of a root five rectangle and be represented by the number 2·236. Make B C equal to C D and B F will be a root five rectangle. B E will equal ·236, E C will equal 2, and A C ·236. The total A B will be 2 plus ·236 multiplied by 2 or the 2·472 proportion, and also equal to ·618 multiplied by 4. A logical development of this base will result in the fixing of all the other proportions of the structure as we find them. The development of the Parthenon proportions or those of any other Greek temple of the best period will show that the preliminary survey is just as simple.

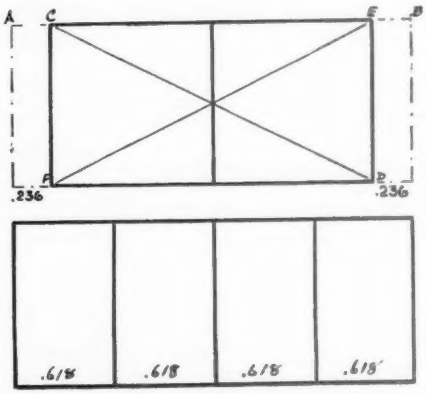


Fig. 3.—Preliminary Survey of the Bassae Temple.

The overall rectangle of the ground plan of the temple at Ægina measures 30·50 by 15·53 metres. The ratio is 1·9635. This proportion is a compound of three 1·528 rectangles. It will be remembered that this 1·528 proportion was stressed in mentioning the ground plan of the Parthenon. The reciprocal of this shape is ·6545, and this multiplied by 3 equals 1·9635. The natural division of this proportion would result in subdividing the area of the Ægina plan into a series of squares and root five figures from which the other proportions would follow. The length of the Naos is 22·785 and its width 8·27 metres. The ratio is 2·764, or four times ·691—this fraction is the reciprocal of 1·4472, or a square plus root five. The error is 2 centimetres, using Furtwangler's measurements.

The length of the cella is 13·245, the width 6·38 metres, and the resulting ratio 2·073 or ·691 multiplied by 3. Error, 9 millimetres.

Intercolumniation strips, centre to centre of the columns across the nave, 3·85 by 2·28, produce the ratio 1·691, or a square plus a square and a root five area. Error, 5 millimetres.

The nave, 12·945 by 3·05, supplies the ratio 4·236 or an area similar to one of the intercolumniation strips of the cella of the Parthenon. Error, 2 and ½ centimetres.

The rectangle from the cella, including the column bases and full length, 13·245 by 4·65 metres, has the ratio 2·8541, or a similar shape of the Naos of the Zeus temple at Olympia. Error, a centimetre. This proportion is equal to root 5 or 2·236 plus ·618.

For the temple at Sunion we may, as we do at Olympia, take Döerpfeld's figures.

The length of the Sunion stylobate is 31·15 and the width 13·48, and resulting ratio 2·309. Error, 1 centimetre. The Greek Archæological Society, by Mr. Orlandos, verifies Döerpfeld except in the figures for the width, which he makes slightly narrower. The difference is unimportant.

2·309 minus ·618 equals 1·691, and plus ·309 it equals 2·618, or the stylobate proportions of the Bassae temple. 2·309 minus ·236 equals 2·073, or ·691 multiplied by 3. (See Ægina.)

The overall plan for Sunion is 32·87 by 15·20 metres, and the ratio 2·163 or 1·691 plus ·236 multiplied by 2. Or, again, 2·8541 minus ·691. Error, 7 millimetres.

Other prime dynamic compounds into which this area might be sub-divided are :

1·309 plus ·854
1·236 plus ·927
1·118 plus 1·045
1·854 plus ·309, etc., etc.

Naos length 20·97 and width 8·32 ; ratio 2·5202. This is a compound of 2·073 plus ·4472—*i.e.*, ·691—multiplied by 3 plus root five.

Bottom step length, 32·67 ; width, 15·00 metres. Ratio, 2·177. This is composed of 1·559 plus ·618 (see Parthenon cella for 1·559, a square and 4 root five areas. Error, 1 and ½ centimetres.

The scheme of the plan of the Zeus temple at Olympia, as Döerpfeld worked it out in his search for even multiples of Greek feet, Æginetan, Solonian or Olympian, has a much superior dynamic interpretation than that furnished by the German scholar. I may digress at this point to give a slight description of Greek feet. The first unit of measure which seems to have come into general use in Greece modern scholars call the "Æginetan foot." It was part of a system of weights and measures obtained by Ægina from the Asiatic mainland, and was the standard unit of length used at Athens before the time of Solon. When that statesman undertook to draft laws to relieve the Athenians of the intolerable burden that the existing laws imposed on them and made so many of them debt prisoners, the old foot was shortened and the weights reduced. The newer shortened foot is now known as the Solonian foot. Several years ago the German archæologist, Döerpfeld, conceived the idea that we should be able to find old Greek units of measure, in whole or multiple parts, in the surviving architecture. He displayed much ingenuity in developing this notion, but, in my opinion, failed because he was unable to determine the precise length of either the Æginetan or the Solonian foot. The former is supposed to stand to the metre as ·328, or ·327, or, possibly ·326 or even less. All of these lengths are necessary in the many different examples given as evidence of its presence. As an illustration : Döerpfeld fixes the height of the Parthenon column as 10·44 metres. It would be closer to the fact if it were 10·438 or less. This is assumed to be exactly 32 Æginetan feet. This would make the foot less than ·326. The width of the nave is given as 9·82 metres. Out of a number of measurements I found 9·82 but once ; all the rest were slightly less. The mean is a little greater than 9·818. The length 9·82 is supposed to be precisely 30 Æginetan feet. But this requires more than ·327. This small fractional difference in short lengths might be disregarded, but for great distances it could not be accepted. However, for avoidance of argument, we may admit that the Parthenon column is exactly 32 Æginetan feet high. What, then, of the other measurements of the building ? Ninety per cent. or more of these would be incommensurable with the 32 feet. The only complete explanation of this incommensurability, so far advanced, is that furnished by dynamic symmetry. Döerpfeld had this column height in mind when he measured the Zeus temple at Olympia. The intercolumniation measurements of this building on

the flanks are remarkably close to one-half the height of the Parthenon column or indeed to one-half the height of the Zeus column itself. With this in mind, Döerpfeld actually gives 5·22 metres for each flank intercolumniation on his drawing of the plan ; but, in a less conspicuous place, he places a plus or minus quantity to be added or subtracted from each 5·22 figure. The average reader, glancing at the plan, sees only the two long rows of 5·22 figures and thinks it a brilliant exposition of scholarly research. As a matter of fact, when we add and subtract these plus and minus quantities we find that one side of the Zeus temple is over 45 centimetres longer than the other. This irregularity is due to earthquake disturbance, from which the building has suffered much. Döerpfeld, however, is not discredited. I mention the matter as an illustration of the handicap of a theory. Having worked against this handicap I can sympathise with other sufferers. It is because of this that I use the measurements of other investigators whenever possible. If privileged to use my own data I could, in most cases, reduce the errors I have mentioned if not entirely remove them.

The mean flank intercolumniation of the Zeus building is 5·217 metres. This agrees better with Döerpfeld's conclusions than does 5·22. I am really of the opinion that the flank intercolumniation was intended to be one-half the column height. This would give it a row of root 4 areas, defined by the column centres, architrave and stylobate, for each flank of the building and, also, would fit the dynamic condition made by the narrower column adjustment at the corners.

When the Zeus temple is measured through the centre, east to west and north to south, the results agree very closely with those obtained by Döerpfeld, so we may proceed with the dynamic arrangement of the plan units.

Euthynteria length, 66·64, and width, 30·20. Resulting ratio, 2·206. Error, less than 1 centimetre. This ratio is a compound of 1·382 plus ·824, an important proportion found in the Parthenon.

Naos length, 46·84 ; width, 16·39 ; ratio, 2·8541. Error, 2 centimetres. Ratio, a compound of root 5 plus ·618.

The entire interior of the cella seems to be a simple root five area with an error of 1 or 2 centimetres. This interior, however, is in a bad mess and extremely great accuracy is doubtful.

The great rectangle made by the column centres has been figured out by Dr. Caskey, who helped me this winter at Olympia in a re-examination of the building. The length of a side of this rectangle is 61·70. At the east end it is 25·24 metres wide and at the west 25·16, average 25·20. The ratio is 2·4472, or two squares plus a root five rectangle (see the proportion of the older Parthenon). 61·70 divided by 2·4472 discloses an error of about half a centimetre.

The bottom step ratio is 2·2236, or two squares plus ·4472 divided by two.

The stylobate length is 64·12 ; width, 27·68 ; resulting ratio, 2·3166 ; error, 3 millimetres. This proportion is a compound of four root five rectangles plus a ·528 shape, more accurately ·5278. This latter fraction will be remembered in connection with the 1·528 proportion of the Parthenon and of the Ægina temple.

We might continue our inspection of these dynamic proportions until every square inch or cubic inch of the buildings were explained, but our limit forbids. I have purposely left out consideration of the elevations as any one familiar with the principles of projection will understand that the two-dimensional plan is of first importance. If the elevations are proportionate with the ground plan, and they are as far as we are able to proceed with the material as it has survived, then the solid is proportionate.*

* Some notes on this lecture, and a brief reference to the discussion which ensued, were published in the JOURNAL for 5th March, pp. 266-67.

CAPITALS AND BASES: A THEORY OF THEIR EVOLUTION.

By F. Welman.

General.

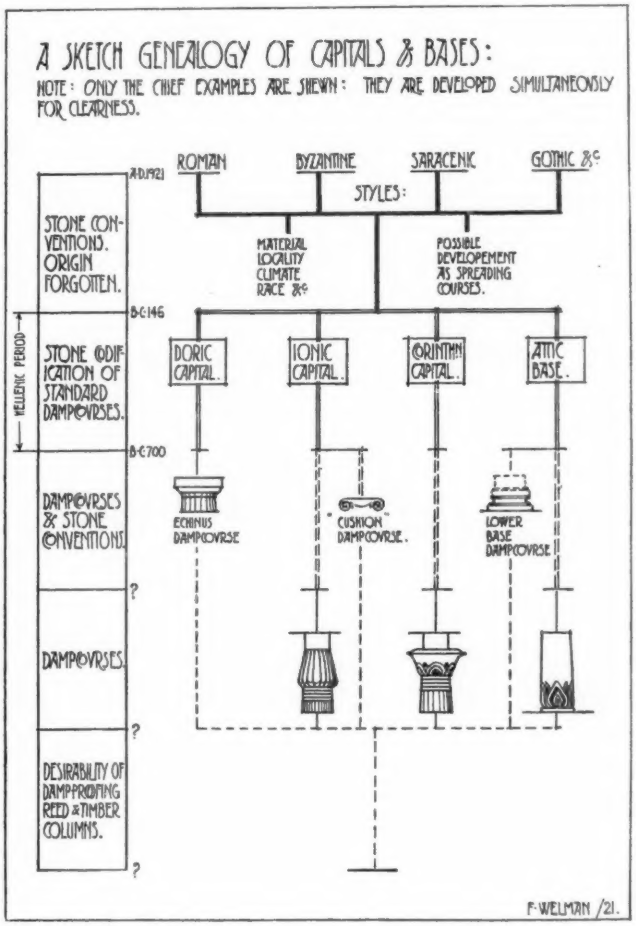
THE presence of the earliest capitals and bases may almost be said to denote the beginnings of architecture, whilst the field of their application is extensive, in regard both to time and place. In some form or other they have been adopted by every established school of design, and their contemporary use is practically universal. Their detailed history is long and complicated, but in respect of an omission it differs from that of nearly all other architectural features. It does not include an authentic genealogy of their forms, or even hint at a reason for their existence. Various theories, based on historical data, have been advanced to account for them, but the evidence available for the purpose is too slight to be conclusive. In default of actual information, however, a genealogy may be evolved by a process of inference and deduction based on an analysis of the members themselves. The conclusions thus derived may be verified within limits by a comparison with known facts.

The Analysis.

Architectural features with a high persistence are generally attributive to a primary function, and capitals and bases may be investigated for indications of that origin. The only function they could exercise in a stone construction is that of spreading courses. In view of their normal inadequacy in that respect, however, it is obvious that they were not designed for the purpose, and they cannot be regarded as "attributive" to it. Thus, as capitals and bases are not accessory to a stone construction, it is assumed that they are reproductions of members accessory to the prototype construction of reed or timber columns. The function of members at the extremities of such columns would obviously be that of damp-proofing, and therefore it is concluded that the primary "capitals" and "bases" were dampcourses, and that stone examples are the later conventionalised reproductions of the same.

The Indicated Prototypes.

The nature of the prototypes, as indicated by these conventions, is that of a bituminous cement, applied hot, in a semi-fluid condition, localised in adequate bulk by strips of woollen fabric and ultimately setting hard. In short, the primary dampcourses are indicated to have been "puddings" of bitumen.



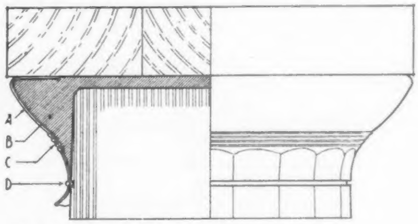
Corroborative Evidence.

In default of records, the circumstantial evidence is

THE PROTOTYPE DAMPCOURSES OF THE CAPITALS & BASE OF THE GREEK ORDERS.

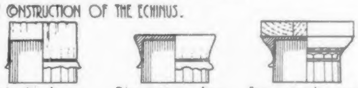
Note Diagrams are not to scale They do not represent actual examples but only their salient features in approximate proportion.

THE DAMPCOURSE OF THE DORIC CAPITAL.



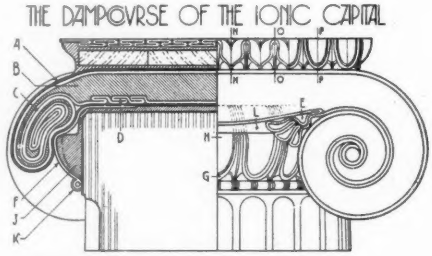
A. Woollen fabric of echinus.
B. Bitumen dampproofing.
C. Annular creases in fabric due to settlement of echinus under weight of abacus &c ("Annulets")
D Binding cord & fabric in groove, isolated from bitumen subsequently decaying & exposing groving ("hypotrachelion")

THE CONSTRUCTION OF THE ECHINUS.



Fabric strip bound around column by cord in groove — Fabric held away from column filled up with bitumen & folded over — Abacus superimposed Echinus distended & "annulets" formed.

THE DAMPCOURSE OF THE IONIC CAPITAL

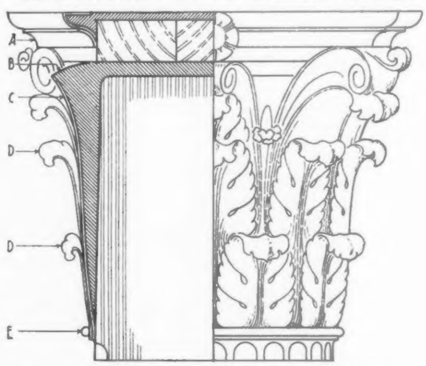


A. Suspensory belting for volute of "cushion" (black)
B. Bitumen dampproofing of cushion
C. Woollen fabric strips of cushion
D Excess fabric on inner side of cushion (folds indicated only)
E External folds of "D" forming "flower ornament" or "palmette"
F Fabric of echinus, pleated vertically
G. Pleating at bottom of echinus.
H. Pleating as distended at top

J. Bitumen of echinus
K. Binding cord for echinus with gathers of fabric around it ("Beads")
L Fabric isolated from bitumen subsequently decaying & exposing characteristic flat top of echinus

Section N-N "Leaf & Dart" — Bitumen expressed over a fold, depressing it, & draining down face of it.
Section O-O "Leaf & Dart" — Bitumen expressed under a fold, supporting it, & draining down face of abacus
Section P-P "Egg & Tongue" — Construction similar to that of echinus applied to a straight edge

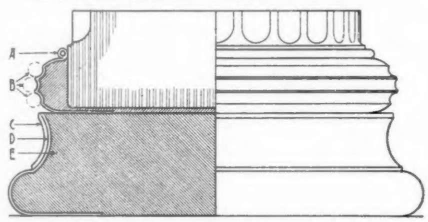
THE DAMPCOURSE OF THE CORINTHIAN CAPITAL.



Note Owing to the inclusion of foliage, this system is indicated for developement on lines of free decorative effect.

A Abacus molding with retaining band, highly conventionalised, & comparable only on broad lines.
B. Bitumen dampproofing, spreading to edge of echinus at a "natural batter."
C. Fabric of echinus ("bell")
D. Reinforcement of leaves to echinus.
E. Binding cord for echinus & reinforcement.

THE DAMPCOURSE OF THE ATTIC BASE.



A Binding cord wrapped in upper edge of fabric around column
B Temporary binding with rope, to retain level of bitumen around column whilst setting.
C "Scotia" band reinforcement to fabric of base casing
D. Fabric of base casing.
E. Bitumen dampproofing.

THE CONSTRUCTION OF THE BASE.

Fabric base casing reinforced by "scotia" band, & filled up with bitumen — Fabric casing for column superimposed, & bitumen poured-in — Column inserted. Fabric casing bound around it, & rope binding added.

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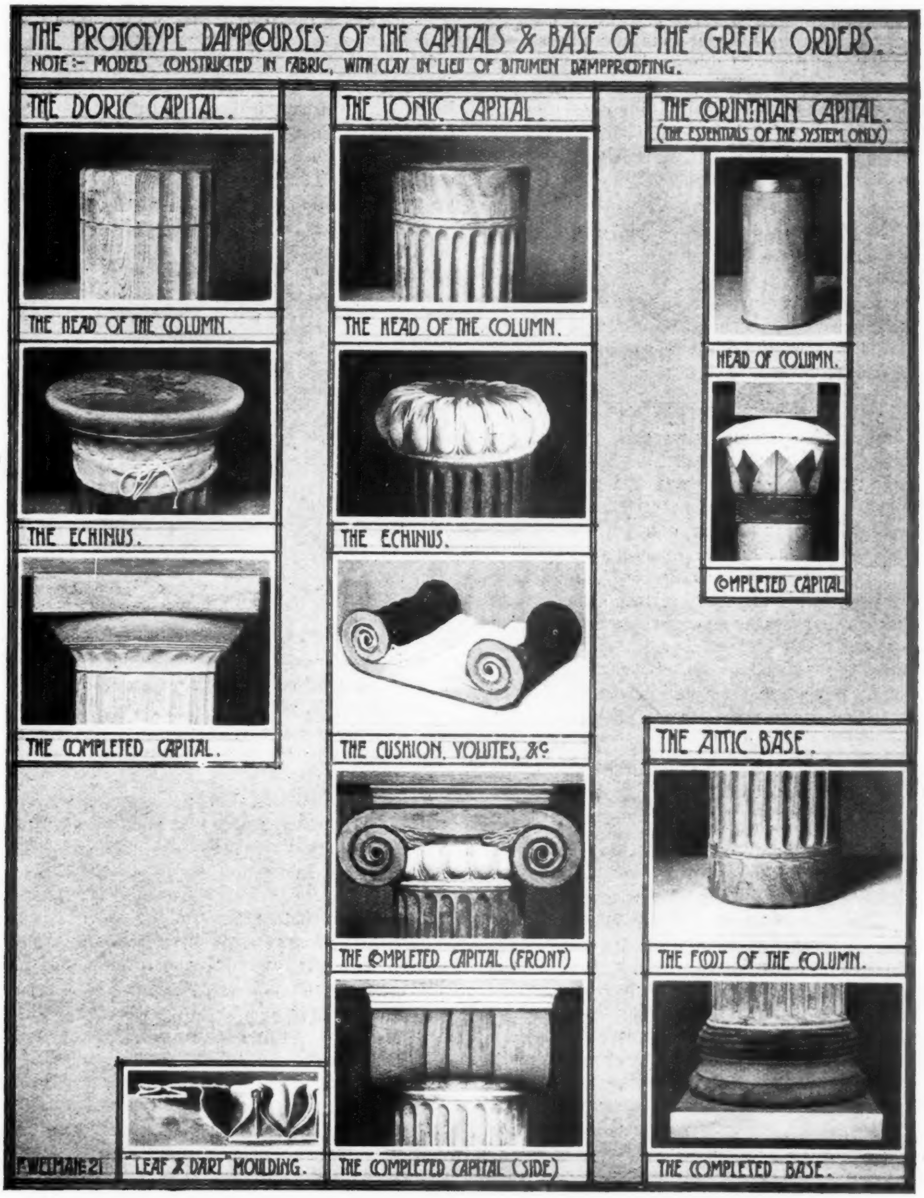
THE PROTOTYPE DAMPCOURSES OF THE CAPITALS & BASE OF THE GREEK ORDERS.
NOTE:- MODELS CONSTRUCTED IN FABRIC, WITH CLAY IN LIEU OF BITUMEN DAMPPROOFING.
THE DORIC CAPITAL.
THE HEAD OF THE COLUMN.
THE ECHINUS.
THE COMPLETED CAPITAL.
THE IONIC CAPITAL.
THE HEAD OF THE COLUMN.
THE ECHINUS.
THE CUSHION, VOLUTES, &c
THE COMPLETED CAPITAL (FRONT)
THE COMPLETED CAPITAL (SIDE)
THE CORINTHIAN CAPITAL.
(THE ESSENTIALS OF THE SYSTEM ONLY)
HEAD OF COLUMN.
COMPLETED CAPITAL
THE ATTIC BASE.
THE FOOT OF THE COLUMN.
THE COMPLETED BASE.
"LEAF & DART" MOULDING.
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consistent with this conclusion. Thus the salient features of certain stone examples are characteristic of a semi-fluid retained by a somewhat elastic membrane, and they may be "turned back" into dampcourses without a change of essential form. Indirect support is also provided by the following circumstances :—

The early use of reed or timber columns under conditions indicating a desirability for damp-proofing.

The use of bitumen in early building construction.

The use of woollen fabric in early times.

The liability of the early columns to destruction by fire.

The Evolution.

The effect of the origin upon evolution would normally be affected by the loss and recovery of the generating idea, by the possibility of developing stone capitals and bases as spreading courses, and by the factors that influenced other architectural features, such as locality, material, climate, tradition, religion, wars and invasions, etc.

The Reconstructed Examples.

The dampcourse systems represented by stone conventions are broadly summarised in the capitals and bases of the Greek Orders. These members practically epitomise the whole art and practice of the dampcourse. They appear to be conventions of bare mechanical essentials, and as such may have been based on an analysis of the standard dampcourses, rather than on preceding stone forms. They are the last examples to indicate the conscious use of such an origin, and the first to be widely adopted as arbitrary decorations. In the latter capacity they constituted the basis for all succeeding designs in the Roman, Byzantine, Saracenic, Gothic and other styles. For those reasons the systems they represent are reconstructed in the following notes and diagrams.

The Dampcourse of the Doric Capital.

General.—There is very little evidence of this system before the Greek era, and it may be of early Greek origin. It was the last to make an appearance, but the first to be conventionalised as a Greek capital. This is a logical sequence, as the current local dampcourse would normally be the first to undergo that process. As a mechanical proposition it is the most advanced of the three capital systems.

The Construction.—The construction is indicated to have been as follows: a plain, unpleated strip of woollen fabric was wrapped closely around the head of the column, the upper edge projecting well above it, and the lower one bound around it by a cord in a groove, or grooves ("hypotrachelion"). The strip was then strained outwards at the top and hot bitumen was poured over and around the head of the column, filling the annular trough formed by the fabric and rising above the top of the column to the required level. When the correct amount of bitumen had been poured in, the upper edges of the fabric strip were folded over it. The timber abacus was superimposed whilst the bitumen was soft, and its weight caused a slight settlement in the dampcourse. The upper part was thus further distended by the bitumen expressed from the top of the column, whilst the lower part was "telescoped" and developed the series of annular creases and wrinkles known as "annulets."

The Annulets.—The character of these annulets depended largely on the elasticity of the fabric. With a high degree of elasticity the fabric could expand outwards to accommodate the slack, and the creases were then few in number, but large. Thus the capital of the Temple of Ceres, with an echinus of the greatest relative projection, has two large annulets. With a low degree of elasticity, the slack was more easily accommodated by the formation of fresh wrinkles, and the creases were then more numerous, but smaller. Thus the capital of the Parthenon, with an echinus of the least relative projection, has five small annulets.

The Hypotrachelion.—The cord and the fabric about and below the grooving were practically isolated from the bitumen, and subsequently decayed, leaving the grooving exposed.

Alternative Binding.—The capitals of the Temple of Ceres represent the fabric as retained by a band in a semicircular sinking, instead of by a cord in a groove, but apparently the method was not widely adopted in later work.

The Dampcourse of the Ionic Capital.

General.—The echinus of this system was represented in the Egyptian "lotus bud" capitals. These members presumably conventionalised the method as applied to reed columns, where an elongation of the damp-proofed area would assist to bind the reeds together and allow the interstices to be filled up. The Ionic echinus represents its application to a timber column.

The Construction.—It consisted of a woollen strip, pleated vertically, projecting well above the head of the column and bound around it by a cord. This cord was wrapped in the lower edge of the fabric, which formed gathers or "beads" around it. There was no necessity for anchorage in a groove, as this echinus was not strained outwards to receive the bitumen, but expanded easily, owing to the vertical pleating. Hot bitumen was poured over the top of the column and drained into the echinus, and when the latter was partly filled the upper edge of the fabric was folded over the bitumen on the top of the column.

"Egg and Tongue" Moulding.—The fabric behind the external vertical folds bulged out between them and formed the "eggs," whilst the external folds were squeezed together into creases and formed the "tongues." As the echinus was only partly filled, the fabric between the bitumen and the top of the column was isolated and subsequently decayed, exposing the flat top of the bitumen, a characteristic feature in the stone conventions.

The "Cushion."—The small amount of bitumen re-

tained on the top of the column by this echinus was augmented by a supplementary dampcourse, represented by the "cushion." This consisted of a layer of bitumen between two or more long strips of fabric, the ends of this "sandwich" being rolled up to retain the bitumen and prevent the fraying of the fabric. The excess fabric on the inner and shorter side of the rolls was folded and tucked in between them and the flat part of the cushion, and externally formed the "flower ornament" or "palmette." The cushion was placed on the top of the column, the rolls being supported by strips of belting which encircled the whole member.

"*Bead and Reel.*"—The fabric of the sandwich was squeezed out between the strips of belting into ridges, which formed the "beads" of the "bead and reel" cushion (Erectheum).

The "Volutes."—The middles of the rolls were constricted by the belting which accommodated the full diameter of the echinus at those points, but the outer edges of the rolls were free to expand and droop and formed the "volutes."

Abacus Mouldings.—Two methods of damp-proofing the abacus are associated with this system. They both consisted of pleated packing strips, which ensured an adequate depth of bitumen and retained the expressed surplus. They are represented by the mouldings of the "egg and tongue" and the "leaf and dart." The construction of the former is practically that of the echinus applied to a straight edge, but that of the latter differs in principle. The pleated strip projecting over the edge of the abacus did not enclose the expressed bitumen, but retained it in its folds. The "leaves" were formed by the bitumen expressed over the underlying folds, and the "darts" by that expressed under the overlying ones.

Variations.—There are many forms of the Ionic capital, but they are all broadly illustrative of the system outlined above. In the case of those of the Erectheum the decorative elaborations are based on constructive elaborations.

The Dampcourse of the Corinthian Capital.

General.—This echinus was represented in the Egyptian "lotus flower" or "bell" capitals. As a mechanical proposition it is the crudest of the three capital systems, and presumably the oldest.

The Construction.—It consisted of a plain woollen strip, the upper edge level with the top of the column and the lower one bound around it by a cord. It formed an annular trough for the bitumen; the upper edge, however, was not folded over it, but "belled" out like an oversailing course or bracket around the column. The semi-fluid bitumen poured over the column worked out to the edge of the "bell" at a "natural batter," and the depth that could be maintained over the column was thus dependent on its projection. In order to provide for this, the echinus was made very deep, and as it was not supported from the top of the column, it was reinforced by leaves, which were bound around it by the cord at the lower edge of the fabric. This reinforcement of leaves prevented distortion and settlement whilst the bitumen was setting. Owing to its inclusion, the system lent itself to development for high decorative effect in which the expression of function played a secondary part. Thus, whilst the above-named features are suggested in the Corinthian examples, they are there treated in a free and highly conventionalised manner and the abacus is modified to harmonise with them. The preceding Egyptian examples, however, are more expressive of primary function, and in the majority of cases the abacus is a plain square block that just covers the top of the column.

The Dampcourse of the Ionic and Corinthian Base.

General.—This dampcourse consisted of two parts. The upper part received the foot of the column and the lower part formed a supplementary pad for it to stand upon. The upper part is represented in Egyptian and Persian bases, but the lower part appears to have been evolved in the Greek era.

The Construction.—This lower part was virtually a shallow fabric pan, reinforced by an encircling band ("scotia") and filled up to the brim with bitumen, which set flat and level. The fabric below the scotia band was distended by the bitumen, and is represented by the lower "torus." The upper part of the dampcourse was another shallow pan, placed on the bitumen in the first. The foot of the column was inserted, bitumen was poured around, and the fabric pan was bound around the column by a cord wrapped in its upper edge. In order to retain the level of the bitumen whilst setting, this member was apparently supported by a temporary binding of rope, which on removal left the annular grooves represented on the upper "torus." In the bases of the Erecthium a band of webbing is conventionalised as an alternative to the temporary rope binding.

Conclusion.

The foregoing reconstructions are based upon assumptions which may be recapitulated thus:—

(1) Early prototype columns of reeds or timber.

(2) Contemporary use of bitumen.

(3) Prototype columns dampproofed with bitumen.

(4) Dampcourse forms reproduced on later stone columns.

To these assumptions is now added the *fact* that the indicated dampcourses normally exhibit the characteristic features of their representative "capitals" and "bases," as will be seen from the accompanying photographs of models.

The potentiality may be regarded as a coincidence, but it seems perfectly logical to accept it as an endorsement of the assumptions.

CORRESPONDENCE.

Unification and the Institute.

St. John's Wood, N.W., 8 *Oct.* 1921.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—I have recently seen, and read with interest, the letter signed by Mr. Perks and Mr. Hubbard indicating that steps are being taken to oppose irregular additions being made to membership of the Institute on the plea that such a course is necessary to effect unification of the profession, which latter, in its turn, is presumed to be essential to obtain the registration of architects.

I am not sure (and probably not many are) as to what unification of the profession means in the sense now under discussion: I am equally not sure that, if it is what I take it to be, it is a particularly desirable thing. On the other hand, like many others, I am confident that such objects as appear to be under consideration do not form a legitimate excuse for attempts to alter the character of the Institute or for going back on the valuable root principle on which it was founded. We are told that even if the course proposed to be taken has disadvantages it will at least be a step towards registration—the creation of a new architectural paradise to evolve which any line of action would apparently be justified. We can, with more than equal reason, assert that—as affecting the Institute—it would not be either justified or excusable. If a Registration Bill ever passes through Parliament (which competent persons have advised is a very remote possibility) probably nothing will be effected but a change of name. Incompetent and tasteless architects and builders will remain, under whatever new designation they might continue, to spoil our towns or countryside. Is that the sort of change, then that we are to imagine will advance architecture? For if such a claim cannot be made, what has the question *per se* to do with the Royal Institute? Do some of our members need reminding that the Institute was founded for the advancement of architecture and the acquirement of knowledge relating thereto, as its Charter states in quite clear terms; that it has steadily kept this aim before it hitherto and by it built up a definite position as a learned Society; that the adhesion of its members has been obtained, in good faith, on the understanding that the qualifying standards laid down would be maintained for all who joined its ranks, certifying to the fact that it stood for high aims and achievement as its founders had intended? Is all this to go now in pursuit of what, at its best, is a very uncertain advantage? I do not really think so. Not all of us are so affected by the imagined benefits of a new system as to be willing to drop the real merits of the old, and with it to throw the Institute overboard if necessary.

Perhaps, after all, the foundation on which the Institute rests—the great principle for which it stands and from which its essential value is derived—may prove to be not so easily overturned as some may think. Possession of a Royal Charter, in itself, involves responsibilities that cannot be lightly set aside A comprehensive system of architectural education, such as we see hopeful signs of being now in evolution, may effect much that is desirable, and can hardly do other than assist the objects for which the Institute exists. But that is quite another matter.—Yours faithfully,

FREDK. R. HIORNS [*F.*].

The Government's Future Housing Policy.

17, *Pall Mall, East, S.W.*1.
6 *Oct.* 1921.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—In his letter, dated 30th August, appearing in the last issue of the JOURNAL, Mr. Durlacher, referring to my letter dated 26th July, suggests that "condemnation of the Government Housing Scheme by the Council and individual architects should be supplemented by some alternative scheme under which they could guarantee that the houses would be forthcoming."

With the object, therefore, of stimulating thought upon this problem, and with no claim to having solved it, I venture to put forward certain reflections and suggestions induced by my participation in the execution of the Government Housing Scheme.

If the housing problem is less conspicuous at the moment than heretofore, it is not because the need for houses has been met. The evils attendant upon insufficient housing are still at work—marriages are postponed, families are restricted, home life is unattractive discontent is rife, and the need for more houses is probably as urgent to-day as it was two years ago.

It is not easy to imagine that anyone conversant with the methods and mentality of the Ministry of Health can contemplate without dismay the prospect of further enterprise by the Government in this direction, and although a sufficient State subsidy on buildings (if not restricted to a size beyond the means of the average wage-earner, or insufficient to the needs of most middle-class families) would undoubtedly produce the houses required, such an expedient is contrary to the ultimate interests of the nation.

We have watched with complacency the gradual extinction of the speculating builder, but I suspect that he may be as essential to the community as the speculating bootmaker, in any case, pending the discovery of other means to a solution of the problem I, for my part, would urge his resuscitation.

We may dislike his bay windows, and deplore his independence of our offices, we may claim that his suburban terraces are stultifying alike to mind and body, but we cannot blink the fact that it is to him we owe the houses in which we have been able to live in some degree of comfort and decency, and at rents proportionate to our means; it is, moreover, possible that contemplation of our State-built houses may have induced in him some knowledge of the methods by which their high standard of beauty has been attained.

Rid at last of the Finance 1910–11 Act incubus, private enterprise in building is still smothered beneath a number of disabilities, and though the suggestions for their removal formulated hereunder may be deemed impracticable, I commend their consideration to all who are interested in a revival of the building industry.

1. *Bye-laws Affecting Buildings.*—These should be standardised and shorn of all conditions unessential to the safety of the community. Pending such revision, all buildings designed and supervised by a member of the Institute or Allied Body should be exempted from their scope, subject to appeal by local Authorities to a tribunal appointed for this purpose.

2. *Excessive Rates and Taxes.*—All new houses, not exceeding a specified size, commenced and completed within the coming year should be exempt for a period of three years.

3. *Competition with the Uneconomic Rent.*—Rent restrictions should be withdrawn, and all houses erected under the Government Scheme should be sold, their value first being enhanced by exemption from rates and taxes, as above.

4. *Lack of Capital.*—State loans should be made on easy terms.

5. *Scarcity of Materials.*—The unemployed should be concentrated upon the quarrying of stones and slates, and upon the making of bricks, cement, tiles and other building materials.

6. *Scarcity of Skilled Labour.*—Apart from joinery, which can be obtained ready-made, and plumbing, which should be inconsiderable, houses of the type most needed can be built from start to finish by the combined efforts of any able-bodied men and women possessed of ordinary intelligence.

7. *High Cost of Labour and Materials.*—With the removal of the disabilities mentioned above, it is probable that speculation in building might be resumed profitably with prices and wages at their present level. The adoption of suggestions 5 and 6 would result in a further decrease in the cost of building now manifest, and with the necessity for increased transport of materials, lower rates for this should be obtainable.

8. *The Stigma Attaching to the Honest Acquisition of Wealth.*—It would be difficult to overstate the disastrous effect upon enterprise of this insidious canker. No sane man is wholly without the desire for the respect of his fellows, and so long as the measure of financial success shall be accepted as the measure of industrial iniquity, undertakings involving the payment of wages will become increasingly repellant. It will take time to restore to successful enterprise the dignity and respect due to all who build and maintain the industries upon which we depend for the necessaries and comforts of life, but the first step in this direction will have been taken when we cease to whine about the "profiteer," whose welcome death was coincident with the firing of the Armistice gun; and when we realise that it is upon the wealth of the manufacturer and merchant that we depend for a plenitude of cheap commodities.—Yours faithfully,

JAMES RANSOME. [*F.*]

Holt, Norfolk, 27 *Sept.* 1921.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—Everyone will agree that destructive criticism is useless without an alternative based on practical possibilities, but before attempting to evolve a sound substitute the essential facts must be grasped.

The policy of taxing improvements in the form of building was condemned from the first by all who were far-sighted enough to realise the ultimate result. Practically every report made by a Royal Commission or Departmental Committee for the past 20 years has, voluntarily or involuntarily, furnished statistics and data which showed we were drifting to a housing crisis. Add to this the opinions of men of experience, and a little common sense reasoning, and it should be apparent that nothing but a change in our system of local taxation could save the building trade.

Mr. Lloyd George, as proved by his speeches, has long been aware of the effect of the existing rating system, and has condemned it in no uncertain terms. Speaking at Middlesbrough in November 1913 he said: "The worst of the present system is that the moment a man begins to improve his property he is fined as a ratepayer. . . . THAT is the rating system of England."

There is nothing new in the policy of exempting or partially exempting buildings from taxation, and the results have been satisfactory in parts of our colonies and the United States. In New York, since the exemption law came into force last February, over 20,000 homes for families have been commenced or planned up to the end of July, as compared with the 6,000 for a similar period in 1920. What is to prevent us from solving our housing (including "workmen's dwellings") problem by following New York's example, without the necessity of subsidies, doles and "compound interest miracles" of finance? Why should not local authorities be at once relieved of poor relief, education, roads, police, and other national service rates, and only be left to deal with purely local matters?

There need not necessarily be much, if any, interference with the present administration of local government, which is very good indeed, apart from the arrangements for financing it.

It cannot matter whether we pay in rates or taxes if the amount is the same, and a graduated tax taking into consideration ability to pay is infinitely better than the unfair and unsound existing rating system, by which we are losing tens of millions in annual value of created wealth, and regular employment for some hundreds of thousands of skilled and unskilled workmen. The poorer the district the higher the rates and with higher rates the more impossible it is to deal with slums and bad conditions of living. The grants to unemployed persons to pay rent and RATES, which necessitates further raising of the rates to pay for the

grants, is the climax of the "vicious circle," and proves the failure of the system by *reductio ad absurdum*.

Surely the necessary legislation can be carried out in a reasonable time, if only as a solution to unemployment.

Many local authorities have sites lying idle through the abandonment of the "housing scheme." Why not immediately give them powers to lay roads, streets, drains, and generally develop the land for building sites, to sell, or let on long leases for building, houses which are exempted from rates? This would be a practical step to relieve unemployment, and give the much-needed stimulus to private enterprise in building. Moreover, the capital outlay would not be thrown away, and there is no reason why such a scheme should not be made economically sound. At least it is well worth trying.

Prices will not come down to an economic level until there is competition, and there will be no real competition until building is made economically possible.

The existing crisis is not the result of the war, but is caused by our apathy in the past and our slowness in applying the remedy.

E. G. HOLTOM [*F.*].

Mr. Northover's Retirement.

4, *Raymond Buildings, Gray's Inn, London, W.C.*1.
3 *October* 1921.

To the Editor, JOURNAL R.I.B.A.,—

DEAR SIR,—I should like to be allowed to add a few words to Mr. Waterhouse's graceful farewell to Mr. Northover.

As President during the first three years of the war, I was constantly under the apprehension of losing Mr. MacAlister, and no one who has not been President, especially during war-time, can know what a support it is to have a secretary who is thoroughly conversant with Institute matters and traditions and whose clear judgment and assistance is always loyally at his disposal. Some time in 1916 when, apart from the Institute, my time and energies were rather strenuously engaged, Mr. MacAlister, after repeated rejections, was accepted for the Army, and I found myself, at a very difficult time, deprived of his invaluable help. It was at this dark hour that Mr. Northover, I was going to say leapt into the breach, but it would be more true to say that he simply appeared, without flourish of trumpet or beat of drum, and whenever any knotty point had to be considered he was always at hand to assist with sound and mature judgment and helpful suggestion. He prepared agendas, attended all Council meetings, and in fact quietly took over everything, including the President, without fuss or friction. All this was in addition to his usual work. The strain must have been very great, but although he sometimes appeared worn, he was never flurried.

I want to take this opportunity of his retirement to tell him how deeply I appreciated his invaluable help during a very difficult time. I hope I did not add unnecessary weight to his already too heavy burden.

Unlike Mr. Waterhouse, I cannot claim that Mr. Northover has shown me any special consideration in regard to literary contributions to the JOURNAL, as they have been very few and always of an official character such as an Editor has to pass, though with a sigh perhaps, but if he has not altogether relinquished the reins I would ask him to be indulgent to this little personal tribute and not to live up to his reputation for modesty by blue pencilling all that refers to himself.—Yours faithfully,

ERNEST NEWTON [*F.*].

"Dell View," Hitchin, Herts,
1 *October* 1921.

To the Editor, JOURNAL R.I.B.A.,—

DEAR SIR,—Mr. Waterhouse, in submitting to readers of the JOURNAL a personal proposal of a vote of thanks to Mr. Northover, safely predicts that we shall accord our votes in favour with ungrudging, if silent, acclamation. Silence may give consent, but I venture humbly to anticipate that I shall be by no means the only one desirous of acclaiming openly our entire and enthusiastic agreement with the proposal.

If I now refrain from rushing in with further tribute to our friend's worth, let my hesitancy be set down to a feeling of satisfaction that our President, divesting himself for the occasion of his official halo, has so happily given expression to what so many of us must have been wanting to say.—Yours,

WALTER MILLARD [*A.*].

6 *Oct.* 1921.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—Mr. Waterhouse helps us signally with the tribute and a personal proposal of a vote of thanks to Mr. Northover to mark our high appreciaton of his valuable services for many years, chiefly in editing this JOURNAL, but silently in various other ways, and conspicuously in performing the duties of the Secretary of the Royal Institute at very real personal sacrifice during the years of the war.

Mr. Northover is an old friend, and perhaps I may be permitted to have the great pleasure of expressing complete agreement with the proposal while rejoicing in the knowledge that he will now be free to rest and have leisure for his own pursuits.

It is pleasant to participate in the general kind feeling and good wishes for our friend, whom we esteem for his willing and helpful disposition and fine sense of duty.

HARRY SIRR [*F.*].

The Institute Journal.

6, *John Street, Bedford Row, W.C.*1.
11 *Oct.* 1921.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—I feel impelled to write to you about the Institute JOURNAL, not so much about its contents, although I believe much could be done to make it more dignified and worthy of a Royal Institute in this respect, but as regards its cover, which has somewhat recently changed its form.

Neither the old nor the new cover is satisfactory in design, even from the point of view of advertisement. Many a trading huckster would not think it sufficiently attractive to cover the illustrations of his wares.

This is unpardonable for architects, who are quite properly expected to have a knowledge of type design and setting. The badge is quite fair and could be allowed to stand, but seeing how easy it is to get reproductions of old English and old French type, and even good type of modern design, the use of type of bastard design for the cover of the JOURNAL is stupid and foolish.

One is reminded about the cobbler's children, who always go about worse shod than other children.

It is a pity Mr. Rickards is not still with us to design a new cover, but if a competition were held among the younger members of the Institute it would surely be possible to find a simple and appropriate design. If not, we are in a bad way, and the sooner we know it the better.

Should such a course not be desirable at present on the ground of expense, for goodness sake let us scrap the present cover and use decent type printed on paper of better colour, relegating the Table of Contents and Dates of Publications to an inside page.—Yours faithfully, W. E. VERNON CROMPTON [*F.*]

The changes which Mr. Crompton suggests are already under consideration.—ED.

RETIREMENT OF MR. HERBERT G. TAYLER, ASSISTANT SECRETARY.

The retirement of Mr. H. G. Tayler marks the termination of a long period of efficient and honourable service at the Institute.

I remember Mr. Tayler more than forty years ago, when he was an active junior assistant to the late Mr. W. H. White. The work of the Institute then was very different from what it is now. An occasional candidate for the Voluntary examination and a few for the District Surveyors' examination formed almost the only deviation from the leisurely routine work of the office. The establishment of the Standing Committees, and more particularly the institution of the obligatory examinations very largely increased this work. In connection with both of these new departures I was brought closely in touch with Mr. Tayler, and his work in connection with the examinations, of which for many years he had almost the entire control, was very heavy. I shall always remember the assiduous and careful attention which he gave to this work, and the Institute owes much to him in connection with it. He also had a great deal of the secretarial work on his hands during the interregnum after Mr. White's death, and again after Mr. Locke's resignation. Mr. Tayler will be much missed, and everyone will wish him many years of health and happiness in his retirement. JOHN SLATER [*F.*]

9 CONDUIT STREET, REGENT STREET, W., 22*nd Oct.* 1921.

CHRONICLE.

Sessional Meetings 1921-1922.

Mondays—at 8 p.m., except when otherwise stated.

1921.

Nov. 7.—PRESIDENT'S OPENING ADDRESS, at 8.30 p.m.

Nov. 21.—SCHOOL DESIGN. By G. H. Widdows [*F.*].

Dec. 5.—Business Meeting: Election of Members.

Dec. 19.—To be announced later.

1922.

Jan. 9.—Business Meeting: Election of Members.

Jan. 23.—ARCHITECTURAL DRAUGHTSMANSHIP. By Professor William Rothenstein, M.A., Principal of the Royal College of Art. AWARD OF PRIZES AND STUDENTSHIPS.

Feb. 6.—PRESIDENT'S ADDRESS TO STUDENTS, at 8.30 p.m. PRESENTATION OF PRIZES.

Feb. 20.—THE INTERNAL DECORATION OF OCEAN LINERS. By Arthur J. Davis [*F.*].

Mar. 6.—Special and Business Meetings: Election of Royal Gold Medallist; Election of Members.

Mar. 20.—THE BUILDING TIMBERS OF THE EMPIRE. By H. D. Searles-Wood [*F.*].

Apr. 3.—LONDON CLUBS. By S. C. Ramsey [*F.*].

May 1.—ANNUAL GENERAL MEETING.

May 15.—THE FIRST HALF-CENTURY OF THE R.I.B.A. By J. A. Gotch, F.S.A. [*F.*].

May 29.—COLOUR IN ARCHITECTURE. By William Harvey, Owen Jones Student, 1913.

June 12.—Business Meeting: Election of Council and Standing Committees; Election of Members.

June 26.—PRESENTATION OF THE ROYAL GOLD MEDAL, at 8.30 p.m.

July 3.—RECENT EXCAVATIONS AT ROME. By Dr. Thomas Ashby.

M. Charles-Louis Girault, Royal Gold Medallist 1920.

It will be remembered that the presentation of the Royal Gold Medal to M. Girault in May last year was deferred in consequence of the industrial crisis at the time. In June of the present year, through the assistance of the Foreign Office, the Royal Medal was despatched to Paris, and on the 20th of that month the

presentation was made to M. Girault by Lord Hardinge, the British Ambassador.

M. Girault, whose portrait appears in the present issue, has had a long and distinguished career. He was born at Cosnes (Nièvre) on the 27th December 1851. In 1873 he was a pupil at the Ecole des Beaux Arts (Atelier Daumet), and gained various prizes during his student's days, including the Grand Prix de Rome. From 1881 to 1884 he was a *pensionnaire* of the Académie de France at Rome, and on his return to Paris in 1885 he was appointed Auditeur du Conseil Général des Bâtiments Civils et Palais Nationaux, and subsequently held many other important appointments. In 1908 he was elected President of the Société Centrale des Architectes Français, in 1919 he became President of the Académie des Beaux-Arts, and was also President (1919-1920) of the Fédération des Sociétés d'Architectes. In 1902 M. Girault was elected a member of the Institut de France in succession to M. Ernest Coquart.

The list of architectural works executed by M. Girault both in France and Belgium is extensive, and includes many notable buildings. He was the architect of the Palais de l'Hygiène at the Exposition Universelle of 1889, the tomb of Pasteur, at the Institut Pasteur (in 1896), the Petit Palais of the Champs Elysées (1896-1900), architect in chief of the Grand Palais, various private dwellings in Paris, and the Louis Pasteur monument, in the Avenue de Breteuil, the latter designed in collaboration with M. Falguière, the sculptor. His works in Belgium include additions to the Royal Castle at Laëken (1901-1902), the Congo Museum at Tervueren (1903-1910), and important works at Brussels and Ostend. During May a collection of photographs, illustrating M. Girault's work, was exhibited in the Institute Galleries.

Union Franco-Britannique des Architectes.

The inaugural meeting of the Franco-British Union of Architects will take place in the rooms of the Institute on the 24th inst., when a number of distinguished French architects, Original Members of the Union, will discuss with their British colleagues the "Statuts" of the new organisation, which, it is hoped, will prove of lasting value, not only from the purely professional point of view, but as an important factor in preserving and strengthening the "Entente Cordiale."

The new association (which is open to practising architects of both countries) owes its inception to Mr. John W. Simpson, who outlined the proposed Union in a Paper which he read at the Joint Conference on Architectural Education which was held in Paris last year.

It is the aim of the promoters of the Union that official business should be limited to a minimum, as it is felt that the purpose of the new organisation can be attained by informal discussions and the joint participation of both French and British members in social functions, visits to buildings, etc.

The arrangements for the first meeting are as follow:

MONDAY, 24TH OCTOBER.

9.30 a.m. Visit to Hampstead Garden Suburb, under the guidance of Mr. Raymond Unwin, Chief Architect, Ministry of Health.

3.0 p.m. Reception of French Original Members of the Union at 9, Conduit Street, by the President of the R.I.B.A.

3.15 p.m. First General Meeting of the Franco-British Union of Architects.
Tea will be served in the Common Room at the conclusion of the meeting; delegates and ladies are invited.

7.30 p.m. The French delegates will be entertained by the Council to dinner at the Café Royal, Regent Street, W.

TUESDAY, 25TH OCTOBER.

Members of the Union will visit Welwyn Garden City under the guidance of Mr. L. de Soissons (*A.*), S.A.D.G.

WEDNESDAY, 26TH OCTOBER.

During the morning French delegates will visit some recent buildings in London under the personal guidance of their architects.

3.0 p.m. French Members will be received by the President and Council of the Architectural Association at 34, Bedford Square, and will pay a visit to the Architectural Association School of Architecture under the guidance of Mr. Howard Robertson, S.A.D.G., Principal.

4.0 p.m. Tea will be served in the A.A. Members' dining room, to which ladies are invited.

The acting Hon. Secretary of the committee is Lieut.-Col. H. P. Cart de Lafontaine, O.B.E., T.D., to whom all communications with regard to membership, etc., of the Union should be addressed.

Smoke Abatement.

Mr. Ernest Newton [*F.*] has recently contributed an interesting article to the *Glasgow Herald* on the "Smoke Nuisance." Referring to effects of the coal strike on the atmosphere of London, Mr. Newton says: "For the first time in living memory town dwellers have been able to enjoy blue sky and floods of sunshine and to breathe clean, wholesome air." Mr. Newton quotes Professor Leonard Hill and Dr. Saleeby, from the interim report (1920) of the Committee of the Ministry of Health on smoke and noxious vapours abatement, as well as American authorities, to demonstrate that coal smoke is injurious to health, damaging to buildings, and "criminally wasteful." It is largely responsible for pneumonia and other respiratory diseases; it causes brick and stone decay. As coal is now used it occasions the loss of valuable by-products, such as dyes, drugs, explosives, motor-spirit, disinfectants, artificial manures, and other materials essential to industry. Mr. Newton's remedy for the present state of things is the substitution of gas and coke for domestic purposes and for the many manufacturing processes for which they are suitable, and scientific stoking where the use of solid fuel is essential.

Nicholas Hawksmoor.

The work of reparation, undertaken by the Art Standing Committee, in connection with the tomb of Nicholas Hawksmoor, in the churchyard of St. Botolph's, at Shenley (Herts), is now completed. Intimation has also been received from the Rector that the framed record of Hawksmoor's life and work (*see* JOURNAL, p. 485) has been hung in a suitable position in the church.

"Guy Fawkes" Ball.

As all the profits are to be devoted to the funds of the First Atelier and the Architectural Association Atelier, for the furtherance of architectural education, it is hoped that there will be a large attendance at the fancy dress "Guy Fawkes" ball to be held in the galleries of the Institute on Friday, November 4th. Fancy dress is compulsory for gentlemen, but Venetian cloaks, dominoes, and fancy dress costumes will be obtainable in the cloak rooms on the evening of the ball. Dancing from 9 p.m. to 5 a.m. Tickets (15s. each: students 10s. 6d. each) may be obtained from the Secretary of the Institute.

Public Works, Roads and Transport Congress.

The Public Works Congress, of which Mr. Waterhouse is a Vice-President, will be held at the Royal Agricultural Hall from the 17th to 18th November. It has been convened for the purpose of discussing the most efficient and economical methods of carrying out all forms of municipal enterprise, such as housing, road construction and maintenance, mechanical traction, street lighting, land settlement, water supply, etc. To members of the Institute desirous of attending the Congress complimentary tickets will be issued on application.

Dr. Belage in England.

Dr. H. P. Belage, President of the Dutch Society of Architects, is shortly coming to England, and is giving the second lecture of the series arranged by the Garden Cities and Town Planning Association, on "Great Cities of the World." Dr. Belage will lecture on "Amsterdam: Past and Present," on Thursday, 10th November, at 5.30, at King's College, Strand, W.C. The chair will be occupied by Sir Walter Townley, K.C.M.G., late British Minister at the Hague. Tickets of admission may be obtained from the Secretary, Garden Cities and Town Planning Association, 3, Gray's Inn Place, Gray's Inn, W.C.1.

British School at Athens.

On the occasion of the annual meeting of the subscribers to the British School at Athens, which will be held in the rooms of the Society of Antiquaries on 25th October, at 4.30 p.m., Miss W. Lamb will give, on behalf of the Director, an account, illustrated by lantern slides, of the recent excavations of the School at Mycenæ, and Mr. S. Casson, the Assistant Director, an account of his recent excavations in Macedonia. H.E. Mons. J. Gennadius will preside.

COMPETITIONS.

Ilford War Memorial.

Members and Licentiates of the Royal Institute of British Architects must not take part in the above competition because the conditions are not in accordance with the published Regulations of the Royal Institute for Architectural Competitions.

Southend-on-Sea. Pier Pavilion Improvement.

The Competitions Committee desire to call the attention of Members and Licentiates to the fact that the conditions of the above competition are unsatisfactory. The Competitions Committee are in negotiation with the promoters in the hope of securing an amendment. In the meantime Members and Licentiates are advised to take no part in the competition.

Bury New Cinema Competition.

The Competitions Committee desire to call the attention of Members and Licentiates to the fact that the Conditions of the above Competition are unsatisfactory. The Competitions Committee are in negotiation with the promoters in the hope of securing an amendment. In the meantime members and Licentiates are advised to take no part in the Competition.

Auckland War Memorial Competition.

The conditions of this Competition have now been amended to meet the views of the R.I.B.A. Competitions Committee and the New Zealand Institute of Architects, and members of the Royal Institute are accordingly at liberty to take part in the Competition.

The date for sending in drawings has been extended to May 1922. A few copies of the conditions are available for reference in the R.I.B.A. Library.

IAN MACALISTER,
19*th October* 1921.] Secretary, R.I.B.A.

The City of Auckland, New Zealand, has raised a fund for the erection, at a cost of £170,000, of a Museum and Institute as a Memorial to those of its citizens who laid down their lives in the Great War.

The design of the building will be the subject of a competition open to all Architects. The Mayor of Auckland has sent a number of copies of the Conditions to the Secretary of the Royal Institute of British Architects, and has requested him to take steps to bring the Competition to the notice of British Architects generally, and in particular to Architectural Students from New Zealand who are studying at the British Schools of Architecture.

Premiums amounting in all to £1,000 will be given to the authors of the first three designs.

Books Received.

A Handbook containing a Collection of Tables and Data for the Design of Constructional Steel Work. [Archibald D. Dawnay and Sons, Ltd., Steel Constructional Engineers and Contractors, Battersea, S.W.]

Reinforced Concrete Construction. Part II. With numerous fully worked examples. By M. T. Cantell, *Licentiate R.I.B.A.* 243 illustrations, including 7 plates. 2nd ed. 8o. Lond., 1921. 16*s.* net.; 16*s.* 9*d.* post free in U.K. [E. & F. N. Spon, Ltd., 57, Haymarket, S.W.]

The Renaissance of Roman Architecture. By Sir Thomas Graham Jackson, Bart., R.A. Part I. Italy. La. 8o. Lond., 1921. 42*s.* net. [Cambridge University Press.]

OBITUARY.

The late Mr. R. St. A. Roumieu [*A.*].

It is with the greatest regret that I have to record the death of Mr. Reginald St. Aubyn Roumieu, which took place on the 3rd October, 1921.

Mr. Roumieu was an Associate of the Royal Institute of British Architects, a Past Grand Superintendent of Works in Freemasonry, and a Knight of Grace of the Order of St. John of Jerusalem. The last distinction was conferred upon him by the sanction of the King in recognition of his many gifts and services to philanthropic and charitable objects.

Born in 1854, Mr. Roumieu was the great-grandson of Abraham Roumieu, who was in practice as an architect in London in 1769, and son of the late Robert Lewis Roumieu, F.R.I.B.A., who was articled to Benjamin Wyatt in 1831, and had a very considerable practice.

On the death of his father, Mr. Roumieu at first continued the practice alone, afterwards taking into partnership the late T. Kesteven Hill, after whose death he was joined by the late Alfred Aitchison, brother of Professor Aitchison, R.A.

The Roumieus, father and son, occupied the same offices, 10, Lancaster Place, Strand, for over 80 years.

Although Mr. Roumieu, with his partners, carried out a large number of buildings, they were not perhaps of sufficient importance to interest others.

I should, however, like to mention one interesting fact: that both father and son each built a Hospital as Honorary Architect, the former "The French Hospital" at Hackney, a hospice for the aged descendants of poor French Protestants, and the latter "The Grosvenor Hospital," Vincent Square, Westminster, a modern hospital for women.

Mr. Roumieu also had a considerable practice as a London surveyor, and was on more than one occasion appointed as official umpire by the Courts.

He was descended from the old Huguenot family of Romieu, who fled from France during the massacres of the Huguenots and settled in this country.

About the year 1885 Mr. Roumieu assisted in forming a society which is now known as the Huguenot Society of London, of which he became in late years the president.

His interest in charities was great and his subscription list a long one.

For a number of years he served on the Council of the Architects' Benevolent Society, and, later, as its Vice-President. He was also an active member of the Committees of the National Benevolent Institution, the Rebecca Hussey Book Charity, and the Westminster French Protestant School.

He was one of the oldest Directors of the French Hospital, to which he acted as Honorary Architect for many years, and was a Governor of the Foundling Hospital.

JOHN PENFOLD [*A.*].

MEMBERS' COLUMN.

Members, Licentiates and Students may insert announcements and make known their requirements in this column without charge. Communications must be addressed to the Editor, and be accompanied by the full name and address. Where anonymity is desired, box numbers will be given and answers forwarded.

Books Wanted.

Wanted, Anderson's *Italian Renaissance*, Ward's *French Renaissance*, and other books on Architectural History, etc. State edition, condition, and price.—W. S. Purchon [*A.*], The Technical College, Cardiff.

Change of Address.

Mr. J. Harold Sayner [*A.*] notifies that he has changed his address to 29, High Street, Great Missenden, Bucks.

Resumption of Practice.

Mr. Manning Robertson, A.R.I.B.A., is resigning his post of Deputy Chief Architect to the Ministry of Health, Housing Department, and is resuming private practice at 50, Norfolk Square, London, W.2. (Telephone: Paddington 1492.)

Partnership.

Young architect of ability and with good references, wishing to purchase a partnership in a first class well established firm of provincial architects, should write stating age, training, qualifications and experience, to Box No. 7101.

Appointments Wanted.

A.R.I.B.A., M.S.A. Aged 28, seeks employment. All-round experience, banking, factory, institutional, engineering, and industrial buildings in steelwork. Salary £350. Excellent references.—Apply Box 241, Secretary R.I.B.A.

AN INDIAN ARCHITECT, at present in England studying for the Final R.I.B.A. Examination, is anxious to enter an Architect's office, if possible in London, with a view to obtaining further experience. Has good knowledge of construction, surveying, etc.—Apply Box 8101, c/o Secretary R.I.B.A., 9, Conduit Street.

Daily Mail Labour-Saving House Competition.—Lic. R.I.B.A. offers to prepare perspective in accordance with the conditions, on competitor's own drawing, at a special fee of £2 2s. finished in ink or £1 1s. pencil outline only.—Address Box 1102, c/o Secretary R.I.B.A.

LICENTIATE, 20 years' varied architectural experience, offers services, temporary or otherwise. Good design, working drawings and draughtsmanship, specifications, supervision of works, surveying, etc. Experience in reinforced concrete and steelwork.—S. H. Goodwin, 95, Chase Side, Enfield.

EX-CAPTAIN, A.R.I.B.A., 34, married and two children. Eleven years' varied experience (excluding five years' overseas in Army); had own practice before war. Now stranded owing to abandonment of work. Willing to tackle any job, architectural or otherwise, if permanent.—Apply Box 1101, c/o Secretary R.I.B.A.

A.R.I.B.A., 29, 2½ years' private practice, good connection and prospects, desires partnership in established London firm. Capital forthcoming if necessary. Box 1310, c/o The Secretary R.I.B.A., 9 Conduit Street, London, W.1.

A.R.I.B.A. desires appointment; is prepared to acquire an interest in established firm after probationary period. Eighteen years' varied experience. Ex-R.A. Schools student. Would join architect in competition or speculative work on mutual terms. Address Box 1421, c/o Secretary R.I.B.A., 9 Conduit Street, London, W.1.

ASSOCIATE, aged 29, wishes to obtain situation with good firm of architects in busy provincial town—Midlands preferred—with a view to partnership. Travelled in Italy and Greece. Experience in Scotland and Midlands. Factory design. Steel and reinforced concrete construction. Address Box 1710, c/o Secretary R.I.B.A., 9 Conduit Street, London, W.1.

Society of Architects.

The Society of Architects are inviting applications for the post of Assistant Secretary. Particulars of appointment may be obtained on application from the Secretary, 28, Bedford Square, London, W.C.

NOTICES.

Election of Members, 5th December 1921.

The following applications for election have been received. Notice of any objection or other communication respecting the candidates must be sent to the Secretary for submission to the Council prior to Monday, 7th November 1921 [See also lists published 11th June and 27th August 1921]:—

AS FELLOWS (8).

BARNISH: LEONARD [A. 1911], Royal Liver Building, Liverpool; 14 Fairview Road, Oxton, Birkenhead.

BEAUMONT: WILLIAM SOMERVILLE [A. 1905], 24, Brazennose Street, Manchester; Beech Mount, Barrington Road, Altrincham, Cheshire.

DAHL: JOHN LOVE SEATON [A. 1909], Radnor Chambers, Folkestone; 23 Edward Road, Bromley, Kent.

EVANS: CHARLES GLYNN [A. 1912], The Croft, Neath; 13 New Street, Neath.

RUSSELL: ROBERT TOR, D.S.O. [A. 1914], P.W.D., Raisina, Delhi, India.

SULLIVAN: BASIL MARTIN [A. 1913], Consulting Architect to the Punjab Government, P.W.D., Secretariat, Lahore, India; 28 Lawrence Road, Lahore, India.

VINING: JOHN NORMAN RANDALL [A. 1905], Rolls Chambers, 89 Chancery Lane, W.C.2.; 23 Hayes Road, Bromley, Kent.

WATKINS: WILLIAM GREGORY [A. 1893], St. Edmond's Chambers, Silver Street, Lincoln; 20, Wragby Road, Lincoln.

AS ASSOCIATES (113).

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PRIZES AND STUDENTSHIPS.

The Air Ministry and the Grissell Prize.

The Air Council have signified their warm appreciation of the decision of the Council of the Royal Institute of British Architects to award the Grissell Prize this year for the best design of an Airship Mooring Mast. The prize consists of a Gold Medal and the sum of £50. The competition is open to architects who are British subjects and have not been in professional practice for more than ten years. As a further indication of their interest in the competition, the Air Council have asked that facilities shall be given them to see the more promising designs submitted by competitors, and express their readiness to nominate an expert to give his assistance to the Grissell Prize Committee on any points in which actual airship experience would be of value.

Mr. Raymond Unwin [*F.*] will give a lecture on 25th October, at the rooms of the Sociological Society, on "Preparations for the General Adoption of Town Planning." Mr. H. V. Lanchester [*F.*] will take the chair at 8.15 p.m.